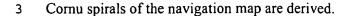


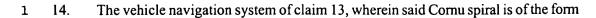
What is claimed is:

CLAIMS

- 1 1. A vehicle navigation system that receives sensor data from a plurality of sensors,
- 2 and provides a map image that is presented on a display, said system comprising:
- a navigation map data memory that includes map data indicative of roadways
- 4 stored in Cornu spiral form; and
- a navigation processing unit that receives the sensor data, and requests map data
- 6 from said navigation map data memory associated with the sensor data, and computes the
- 7 map image from said map data.
- 1 2. The vehicle navigation system of claim 1, wherein said map data includes a data
- 2 indicative of a unit Cornu spiral.
- 1 3. The vehicle navigation system of claim 2, wherein said navigation processing unit
- 2 computes said map image using Cornu spiral polynomial coefficients stored in said
- 3 navigation map data memory.
- 1 4. The vehicle navigation system of claim 2, wherein terms of polynomials of the unit
- 2 Cornu spiral are stored in said navigation map data memory and said map image is
- 3 computed using said terms of polynomials of the unit Cornu spiral.
- 1 5. The vehicle navigation system of claim 4, wherein said terms of polynomials are
- 2 associated with Taylor series expressions indicative of said Cornu spiral.
- 1 6. The vehicle navigation system of claim 5, wherein said Cornu spiral is of the form
- $l = Ka^2$, where l is indicative of arc length and K is indicative of curvature.
- 1 7. The vehicle navigation system of claim 5, wherein said navigation map data
- 2 memory includes coordinates of the unit Cornu spiral stored in a table, from which all the



- 1 8. The vehicle navigation system of claim 5, wherein said navigation map data
- 2 memory includes coordinates of the unit Cornu spiral stored in a table, from which all the
- 3 Cornu spirals of the navigation map are derived for roads, railroad lines, rivers, lakes, and
- 4 similar cartographic parameters defined as Cornu spirals.
- 1 9. A vehicle navigation system that receives sensor data from a plurality of sensors,
- 2 and provides a map image that is presented on a display, said system comprising:
- a navigation map data memory that includes map data indicative of roadways
- 4 stored in Cornu spiral form; and
- 5 means for receiving the sensor data, for requesting map data from said navigation
- 6 map data memory associated with the sensor data, and for computing the map image from
- 7 said map data.
- 1 10. The vehicle navigation system of claim 9, wherein said map data includes data
- 2 indicative of a unit Cornu spiral.
- 1 11. The vehicle navigation system of claim 10, wherein said navigation processing unit
- 2 computes said map image using Cornu spiral polynomial coefficients stored in said
- 3 navigation map data memory.
- 1 12. The vehicle navigation system of claim 11, wherein terms of polynomials of the
- 2 unit Cornu spiral are stored in said navigation map data memory and said map image is
- 3 computed using said terms of polynomials of the unit Cornu spiral.
- 1 13. The vehicle navigation system of claim 12, wherein said terms of polynomials are
- 2 associated with Taylor series expressions indicative of said Cornu spiral.



- $l = Ka^2$, where l is indicative of arc length and K is indicative of curvature.
- 1 15. The vehicle navigation system of claim 13, wherein said navigation map data
- 2 memory includes coordinates of the unit Cornu spiral stored in a table, from which all the
- 3 Cornu spirals of the navigation map are derived.
- 1 16. The vehicle navigation system of claim 13, wherein said navigation map data
- 2 memory includes coordinates of the unit Cornu spiral stored in a table, from which all the
- 3 Cornu spirals of the navigation map are derived for roads, railroad lines, rivers, lakes, and
- 4 similar cartographic parameters defined as Cornu spirals.
- 1 17. A method of computing a map image in a vehicle navigation system that receives
- 2 sensor data from a plurality of sensors, comprising:
- 3 providing map data indicative of roadways stored in Cornu spiral form in a
- 4 navigation map data memory device;
- 5 receiving the sensor data, and in response thereto requesting map data from said
- 6 navigation map data memory device; and
- 7 computing the map image from said map data.